

* To Examiners Reference

WHAT WE CLAIM IS:

1. A combination exhaust gas post treatment/muffler device
in the exhaust gas section of an internal combustion engine,
comprising:

a muffler 1 that is spatially delimited by a front end wall 2,
a rear end wall 3, and a peripheral outer wall 4, wherein said muffler 1
is provided with an inlet 13 for exhaust gas that is to undergo post
treatment;

at least one exhaust gas post treatment/muffler module 7
built into said muffler 1 as a system core, wherein said at least one
module is provided with a housing composed of a plurality of housing
portions;

at least one preliminary oxidation catalytic converter 5
disposed in a first one of said housing portions 8, 8', 8'', wherein said at
least one catalytic converter 5 significantly increases an amount of NO₂
in exhaust gas flowing through said muffler 1, wherein said first
housing portion is followed by a second one of said housing portions 9,
9', 9'', which widens in a funnel-shaped manner and delimits a transfer
chamber 12, 12', 12'', and wherein said second housing portion is
followed by a third one of said housing portions 10, 10', 10'';

at least one exhaust gas post treatment device (6) disposed in said third housing portion, wherein said third housing portion is followed by an end housing portion (11, 11', 11'') for collecting cleaned exhaust gas and discharging said cleaned gas from said muffler (1) in a muffled manner; and

wherein all of said housing portions of said at least one module (7) are made of ferritic or austenitic stainless steel that is resistant to sulfuric acid, and wherein said front end wall (2) said rear end wall (3), said peripheral outer wall (4), said inlet (13), and any inner element of said muffler (1) disposed externally of said at least one module (7) are made of an unalloyed sheet steel that is coated with aluminum or other material for protection against corrosion.

2. A combination exhaust gas post treatment/muffler device according to claim 1, wherein said at least one exhaust gas post treatment device (6) is a particle filter, catalytic particle separator or catalyzer or catalytic converter.

3. A combination exhaust gas post treatment/muffler device according to claim 1, wherein said at least one exhaust gas post treatment/muffler module (7) is provided with a housing that is composed of two individual prefabricated parts, wherein either said two first and second housing portions (8, 9) or said three first, second and third housing portions, form a first module housing part, and wherein said

third (10) and end (11) housing portions or only said end housing portion (11) forms a second module housing part that is either fixedly connected with said first housing part or is detachably connected therewith via a connection mechanism.

5 4. A combination exhaust gas post treatment/muffler device according to claim 3, wherein said first housing portion is circular cylindrical and is adapted to an outside of said at least one preliminary oxidation catalytic converter (5) disposed therein, wherein said second housing portion 9 that delimits said transfer channel (12) coaxially follows said first housing portion 8 as a funnel-shaped widened portion and thereafter coaxially follows said third housing portion (10) which has a circular cylindrical configuration and which is adapted to the outside of said at least one exhaust gas post treatment device (6) disposed therein, and wherein said end housing portion (11) which forms an exhaust gas/muffler end tube, has a starting portion (11/1) that coaxially follows said third housing portion (10) with the same diameter as a diameter of said third housing portion and then tapers in a funnel shaped manner and merges into a circular cylindrical end portion (11/2) via which said end housing portion (11) is guided in a gas tight manner out of said muffler (1).

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5. A combination exhaust gas post treatment/muffler device according to claim 1, wherein said at least one exhaust gas post

treatment/muffler module (7) is composed of a plurality of exhaust gas post treatment modules that open into a common end housing portion (11').

5 6. A combination exhaust gas post treatment/muffler device according to claim (5) wherein said exhaust gas post treatment modules all have the same configuration and design, and each have a housing, on an inlet side of which is disposed a preliminary oxidation catalytic converter (5) and on an outlet side is disposed an exhaust gas post treatment device (6) between which is disposed a transfer chamber (12')
10 that widens in a funnel-shaped manner toward said exhaust gas post treatment device (6).

7. A combination exhaust gas post treatment/muffler device according to claim (6) wherein said housings of said exhaust gas post treatment modules are disposed axis parallel to one another and, in the
15 interior of said muffler (1) to a longitudinal axis thereof, wherein a transverse wall (51) is disposed in said muffler (1) wherein said modules pass through openings in said transverse wall and on the outside are gas tight with said transverse wall, wherein said transverse wall (51) separates an exhaust gas flow-in chamber (52) from a further chamber
20 (53) in said muffler (1) and wherein each of said modules communicates on an input side with said exhaust gas flow-in chamber (52) and on an output side opens out into said end housing portion (11').

8. A combination exhaust gas post treatment/muffler device according to claim (5), wherein the housing of said exhaust gas post treatment/muffler module (7) is composed of the housing of said exhaust gas post treatment modules and said end housing portion (11'), wherein said first housing portion is formed by the first housing portion (8') of said modules, wherein said second housing portion is formed by the funnel-shaped widening housing portions (9') of said modules, wherein said third housing portion is formed by said third housing portions (10') of said modules, wherein each first housing portion (8') has a circular cylindrical configuration and is adapted to the outside of said preliminary oxidation catalytic converter (5) disposed therein, wherein said second housing portion (9') which widens in a funnel-shaped manner and delimits a transfer chamber (12'), coaxially follows said first housing portion (8') and is in turn coaxially followed by said circular cylindrical third housing portion (10') which is adapted to the outside of said exhaust gas post treatment device (6) disposed therein.

9. A combination exhaust gas post treatment/muffler device according to claim 7, wherein a starting portion (11/1') of said end housing portion (11') peripherally surrounds an outside of said third housing portion (10') of said exhaust gas post treatment modules and is peripherally adapted in a form-fitting manner to peripheral portions of said modules, wherein said starting portion 11/1' of said end housing

portion (11') is fixedly secured at an end face in a gas tight manner to said transverse wall (51) or is secured in a gas tight manner thereto via a detachable connecting mechanism, wherein a central portion (11/2') of said end housing portion (11'), downstream of discharge planes of said exhaust gas post treatment modules, tapers in a funnel-shaped manner to an end region (11/3') that is preferably formed by a circular cylindrical end tube via which said end housing portion (11') is guided out of said muffler (1) in a gas tight manner.

10. A combination exhaust gas post treatment/muffler device according to claim 1, wherein said at least one exhaust gas post treatment/muffler module (7) is provided with a housing composed of a plurality of individually prefabricated partial housings (8", 9", 10", 11") wherein a preliminary oxidation catalytic converter (5) is disposed in said preferably circular cylindrical first housing portion (8"), which is coaxially followed by a second housing portion (9") that widens in a funnel-shaped manner, delimits a transfer chamber (12") and on an end is connected in a gas tight manner to a transverse wall (54) that in said muffler (1) separates an exhaust gas flow-in chamber (55) from another chamber (56) wherein said at least one exhaust gas post treatment/muffler module (7) is provided with a plurality of gas exhaust post treatment modules, each of which accommodates, in one of said partial housings (10") an exhaust gas post treatment device (6) disposed therein, wherein

each of said modules, along with its partial housing (10'') communicates via a respective opening (57) in said transverse wall (54) with said transverse chamber (12''), and on an end face is connected in a gas tight manner to said transverse wall (54) and via an outer peripheral portion is adapted in a form-fitting manner to an inner peripheral region of said end housing portion (11''), wherein a starting region (11/1'') of said end housing portion (11'') peripherally surrounds an outside of said partial housings (10'') of said exhaust gas post treatment modules, wherein an end face of said starting region (11/1'') is fixedly secured in a gas tight manner to said transverse wall (54) or is secured thereto via a detachable connection mechanism, and wherein a central portion (11/2'') of said end housing portion (11'') downstream of discharge planes of said modules, tapers to an end region (11/3'') that is preferably formed by a circular cylindrical end tube via which said end housing portion 11'' is guided out of said muffler 1 in a gas tight manner.

11. A combination exhaust gas post treatment/muffler device according to claim 1, wherein said end housing portion (11, 11', 11'') for sound-dampening purposes, is entirely or partially perforated or provided with individual holes, and/or is coated on the outside over its entire length or over only part of its length with sound-dampening material.

12. A combination exhaust gas post treatment/muffler device according to claim 3, wherein said at least one exhaust gas post treatment/muffler module 7 is fixed in position in an inner space of said muffler 1 via at least one gas tight or exhaust gas permeable transverse wall or support.

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